Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy											Date: May 2017	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205633N *I Aviation Improvements*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	1,235.307	103.685	120.861	119.099	-	119.099	122.717	120.587	119.417	121.806	Continuing	Continuing
0601: *Acft Handling & Service Equip*	29.232	2.254	2.631	2.722	-	2.722	2.780	2.840	2.739	2.793	Continuing	Continuing
0852: *Consolidated Auto Support System*	155.007	6.382	6.494	6.661	-	6.661	6.815	6.959	7.010	7.149	Continuing	Continuing
1041: *Acft Equip Repl/Maint Prog*	46.599	3.400	3.245	3.356	-	3.356	3.383	3.502	3.587	3.657	Continuing	Continuing
1355: *Propulsion and Power Component Improvement Program*	980.412	73.811	93.543	94.001	-	94.001	105.965	106.482	106.081	108.207	Continuing	Continuing
2269: *Expeditionary Airfield Improvements*	24.057	17.838	14.948	12.359	-	12.359	3.774	0.804	0.000	0.000	0.000	73.780

A. Mission Description and Budget Item Justification

Project 0601 - Common Ground Equipment is a Naval Aviation Project to apply new technology to common support equipment necessary to support multiple aircraft.

Project 0852 - Consolidated Automated Support System is a standardized Automated Test Equipment with computer assisted, multi-function capabilities to support the maintenance of aircraft subsystems and missiles.

Project 1041 - Aircraft Equipment Reliability/Maintainability Improvement Program is the only Navy program that provides engineering support for in-service out-of-production aircraft equipment, and provides increased readiness at reduced operational and support cost.

Project 1355 - Aircraft Engine Component Improvement Program develops reliability and maintainability and safety enhancements for in-service Navy aircraft engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, fuel systems, fuels, and lubricants.

Project 2269 - The Expeditionary Airfields (EAF) program designs, develops, tests and fields a sustainment lighting system to replace existing obsolete legacy EAF lighting system.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Navy					Date: May 2017
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0205633N *I Aviation Improvements*			
B. Program Change Summary ($ in Millions)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Previous President's Budget	106.255	120.861	134.664	-	134.664
Current President's Budget	103.685	120.861	119.099	-	119.099
Total Adjustments	-2.570	0.000	-15.565	-	-15.565
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.318	0.000			
• SBIR/STTR Transfer	-2.252	0.000			
• Program Adjustments	0.000	0.000	-14.482	-	-14.482
• Rate/Misc Adjustments	0.000	0.000	-1.083	-	-1.083

Change Summary Explanation

Cost: Not Applicable

Schedule:

Project 0601: Carrier Crash Crane Milestone B and Milestone C realigned and rescheduled due to requirement updates from F-35 incorporation in the Requirement Analysis Document and the removal of Assault Ship from the procurement. Milestone B shift from 1st quarter FY17 to 2nd quarter FY19 and Milestone C shift from 4th quarter FY19 to 1st quarter FY22.

Project 0852: eCASS milestone Full Rate Production Decision Review and contract award for Full Rate Production shift from 3rd Quarter FY 2016 to 1st Quarter FY 2017 in order to resolve deficiencies found during the test sprint periods. Resolving these deficiencies improves product effectiveness for Navy and Marine operators and will ensure repeatable manufacturing production. EO3 Technology Development was added as an FY18 planned project. This project will develop, integrate and test technical solutions to resolve EO3 obsolescence issues, including a near infrared camera, that are capable of supporting the maintenance and repair of the F/A-18 ATFLIR and H-60 MTS weapon systems.

Project 2269: Sustainment Lighting System (SLS) production milestone for Full Rate Production Lot 1 moved from 2nd Quarter FY 2019 to 4th Quarter FY 2019. SLS Critical Design Review moved from 4nd Quarter FY 2016 to 2nd Quarter FY 2017.

Technical: Not Applicable.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0601 / *Acft Handling & Service Equip*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0601: *Acft Handling & Service Equip*	29.232	2.254	2.631	2.722	-	2.722	2.780	2.840	2.739	2.793	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Common Ground Equipment is a Naval Aviation project to apply new technology to common support equipment necessary to support multiple systems/aircraft within the Navy. The common support equipment items developed with this budget are briefed to the Air Force, Army and Coast Guard for possible use in joint procurement in the production phase.

New programs are Turbo Shaft Engine Dynamometer Technology Development and Borescope Technology Development in FY18. Turbo Shaft Engine Dynamometer Technology Development involves efforts to develop a next generation ability to test the latest T700 engine's which will require higher torque levels than are currently available. Borescope Technology Development is to identify ways to increase availability and reliability of the current generation of borescopes that will become unsupportable as the manufacturer will stop support by FY22.

Funding supports the evaluation, testing and integration to develop Portable Electronic Maintenance Aids (PEMA) Commercial Off the Shelf solution for portable device deployments across the Naval Aviation Enterprise. PEMA is a portable device utilized by maintainers with the implementation of digital maintenance capabilities (digital publications, Interactive Electronic Technical Manuals, Internet Protocol based data uploads, Binary digit data downloads, automated diagnostics, and planeside Naval Aviation Logistics Command/Management Information System. PEMAs are a mandatory display device supporting modern day Automated Maintenance Environment implemented for weapon systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Turbo Shaft Engine Dynamometer Technology Development	0.000	0.000	0.575	0.000	0.575
Articles:	-	-	-	-	-
Description: Develop, integrate, and evolve dynamometer technologies and capabilities for insertion into testing of turbo shaft engines. Current V35 dynamometer used to test T700 engines at the intermediate maintenance level has obsolescence issues and worn components that have been overhauled three times since initial fielding in the 1980s. The OEM has stated that it does not recommend a fourth overhaul due to structural issues. Insertion of new dynamometer technologies is required to test next generation T700 engines with increased torque and horsepower and to retire legacy units which have tired metal due to cycle fatigue.					
FY 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** Perform market research of various dynamometer technologies needed to meet current and emergent T700 engine performance requirements. Evaluate dynamometer technology alternative solutions and perform analysis of alternatives to support development of an acquisition strategy for technology insertion and legacy dynamometer replacement. ***FY 2018 OCO Plans:*** N/A					
Title: Borescope Technology Development	0.000	0.000	0.483	0.000	0.483
Articles:	-	-	-	-	-
Description: Develop, integrate, and evolve borescope technologies to meet emergent jet engine inspection requirements. Current fielded engine borescopes are unable to measure required defects on aircraft turbine engine compressor blades to the accuracy required. Additionally, current legacy borescopes will not be supported by the original equipment manufacturer beyond FY22. Legacy borescopes are susceptible to damage due to the insertion tube not being detachable/removable. A detachable insertion tube would increase system availability and reduce repair costs. New borescope technology is needed to improve defect measurement accuracy and equipment supportability. ***FY 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** Perform market research of various borescope technologies needed to meet current and emergent engine inspection requirements. Evaluate borescope technology alternative solutions and perform analysis of alternatives to support development of an acquisition strategy for technology insertion and legacy borescope replacement. ***FY 2018 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Title: Aircraft Spotting Dolly (ASD)	0.739	0.300	0.000	0.000	0.000
Articles:	1	1	-	-	-
Description: There are no commercially available towing vehicles that could even be modified to replace the capabilities of the present SD-2. An R & D effort will be required to design its replacement. Advances in batteries and alternating current motor drive systems in the past decade have made it feasible to design an electrically powered vehicle for the CV, CVN, and L-Class hanger deck spotting missions. Such a vehicle will be inherently more reliable, reduce maintenance, and eliminate the fumes and noise generated by a diesel engine. An electrically driven vehicle will provide much greater motion control for slow speeds to aid in the engagement to the aircraft nose gear. Proximity sensors will be incorporated to automatically stop the spotting dolly prior to accidental impact with the aircraft, other support equipment or bulkheads, increasing the safety of the spotting operations. The legacy ASD is close to thirty years old and experiencing parts obsolescence issues and general efficiency degradation. ***FY 2016 Accomplishments:*** Perform source selection, award prototype contract, and begin prototype phase. ***FY 2017 Plans:*** Perform government testing of prototype. ***FY 2018 Base Plans:*** N/A ***FY 2018 OCO Plans:*** N/A					
Title: Carrier Crash Crane (CV)	1.070	1.886	0.964	0.000	0.964
Articles:	-	-	-	-	-
Description: Name change from Carrier/Amphibious Assault Ship Crash Crane (CV/AACC) to Carrier Crash Crane (CV) due to crane no longer supporting amphibious assault ship. CV are required to remove damaged aircraft from the flight deck. In 2004, a solicitation for a commerical off the shelf replacement for the existing shipboard crash crane was issued. Two bids were received, and after a complete evaluation with many rounds of discussions with the companies bidding, both proposals were found to be technically inadequate and the procurement effort was discontinued. As a result, the crash cranes have continued operation unchanged. Designed in the late 1980's, major systems are beginning to experience the obsolescence of spare parts and are					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
in need of updating. R&D resources are needed to identify not only replacements, but new technologies, which can increase the reliability and maintainability of this flight ops critical piece of equipment. Systems updates would include the engine/generator and electrical updates to the motor drive/control system. An exploration of power sources other than diesel engines would be considered and a corrosion resistant boom. ***FY 2016 Accomplishments:*** Prepare source selection documentation, prepare test plan documents and initiate source selection. ***FY 2017 Plans:*** Continue source selection documentation, continue test plan documents and continue source selection. ***FY 2018 Base Plans:*** Prepare contract spec, RFP, SOW and prepare for source selection. ***FY 2018 OCO Plans:*** N/A					
Title: Portable Electronic Maintenance Aid (PEMA) ***Articles:*** ***Description:*** Portable Electronic Maintenance Aid (PEMA) funding supports the evaluation, testing and integration to develop PEMA Commercial Off-the-Shelf (COTS) solution for portable device deployments across the Naval Aviation Enterprise. PEMA is a portable device utilized by maintainers with the implementation of digital maintenance capabilities (digital publications, Interactive Electronic Technical Manuals, Internet Protocol based data uploads, Binary digit data downloads, automated diagnostics, and planeside Naval Aviation Logistic Command Management Information System. PEMAs are a mandatory display device supporting modern day Automated Maintenance Environment implemented for weapon systems. ***FY 2016 Accomplishments:*** Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the Global Information Grid (GIG) prior to deployment to the fleet by a yearly release cycle. ***FY 2017 Plans:***	0.445 -	0.445 -	0.700 -	0.000 -	0.700 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the GIG prior to deployment to the fleet by a yearly release cycle. ***FY 2018 Base Plans:*** Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the GIG prior to deployment to the fleet by a yearly release cycle. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.254	2.631	2.722	0.000	2.722

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APN/0705: *Ground Support Equipment - CSE/ICP*	93.279	91.671	84.915	-	84.915	87.455	84.951	87.028	88.766	Continuing	Continuing
• OPN/4268: *Aviation Support Equipment - PEMA*	7.762	7.280	6.815	6.094	12.909	7.301	7.482	7.612	7.753	Continuing	Continuing

Remarks

D. Acquisition Strategy

Common Ground Equipment: This is a non ACAT program. Field activities propose tentative projects. Internal panel merits and selects projects. Field activities develop projects and submit results. Operational Advisory Group process selects projects to transition to procurement.

Portable Electronic Maintenance Aids: The management approach includes the Program Management Office residing at NAVAIR with Milestone Decision Authority delegated to the Naval Air Systems Command Chief Information Officer. The evolutionary development approach will be used to execute requirements. Contracting for the prime integrator will be via competitively awarded Indefinite Delivery/Indefinite Quantity contracts.

E. Performance Metrics

Milestone Reviews

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0852 / *Consolidated Auto Support System*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0852: *Consolidated Auto Support System*	155.007	6.382	6.494	6.661	-	6.661	6.815	6.959	7.010	7.149	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The electronic Consolidated Automated Support System (eCASS) project is the system design and development of the latest generation of the US Navy's CASS family of automatic test systems. The legacy CASS system was designed and developed in the 1980's and commenced fielding in 1992. As such, it is reaching the end of its useful life due to obsolescence issues. eCASS is the replacement system for legacy CASS systems, which provides Naval aircraft avionics component maintenance and repair support at Intermediate and Depot maintenance facilities both shore-based and afloat. As a CASS replacement program, the eCASS program objectives remain the same as that of CASS. Specifically: (1) increase material readiness; (2) reduce life cycle costs; (3) improve tester sustainability at depot and intermediate maintenance levels; (4) reduce proliferation of unique test equipment, and (5) provide test capability for existing and emerging avionics/electronics aircraft weapon systems.

The Test Technology Development project involves analysis, application, maturation, integration and testing of emerging electronic, mechanical and optical test technologies for potential military utility in support of Naval avionics testing and repair. Specific technologies being developed include synthetic instruments, advanced electro-optics capabilities, high speed bus technologies, and modernization elements for the CASS family of automatic test systems.

The Third Generation Electro-Optical (EO3) Technology Development project consists of the design and development of technology solutions, including a near-infrared camera solution to replace the existing obsolete EO3 console camera, for use in 65 fielded Navy test systems at both shore-based and afloat sites. The EO3 console subsystem is hosted by the US Navy Consolidated Automated Support System (CASS/eCASS) family of automatic test systems and is used to test, diagnose and repair the H-60 Multi-spectral Targeting System (MTS) and F/A-18 Advanced Targeting Forward Looking Infrared (ATFLIR) weapon systems. The objective of the EO3 Technology Development project is to extend the useful life of fielded EO3 systems in order to sustain H-60 MTS and F/A-18 ATFLIR weapon system readiness until a next-generation EO replacement system can be designed, developed, produced, and fielded.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: eCASS Development	5.303	3.722	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop, integrate and test an Automatic Test System (ATS) to replace legacy CASS systems. The new ATS will be compatible with and capable of hosting the hundreds of existing Test Programs that are currently utilized on legacy CASS at the Intermediate and Depot levels of maintenance, as well as any emerging Test Programs that may require greater test capability than provided by legacy CASS.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2016 Accomplishments: Continue test events. ***FY 2017 Plans:*** Develop, integrate, prototype design changes to support Test Program Set (TPS) migration for existing eCASS TPS candidates. Emphasis will be to develop and evaluate potential solutions to support development of future Engineering Change Proposals (ECPs). ***FY 2018 Base Plans:*** N/A ***FY 2018 OCO Plans:*** N/A					
Title: Test Technology Development	1.079	2.772	2.382	0.000	2.382
Articles:	-	-	-	-	-
Description: Develops, integrates, and evolves enhanced test capabilities and technologies for insertion into the Consolidated Automated Support System (CASS) family of test systems. As weapon system electronics evolve, new test capabilities are required to support advanced systems. Existing test capabilities must be extended in range, accuracy, time and frequency domains in order to sustain the required test accuracy ratios for weapon systems support (the automatic test system must be four times as accurate as the asset being tested). ***FY 2016 Accomplishments:*** Develop, integrate, and evolve enhanced test capabilities and technologies for insertion into the CASS family of test systems. Perform market research into various near infrared camera technology, generate analysis of alternatives, and develop an acquisition strategy for the obsolete EO3 camera replacement technology solution. Conduct studies and develop alternatives for the replacement of the CASS EO3 console with a next generation solution. ***FY 2017 Plans:*** Design and develop two prototype near infrared camera assemblies. Evaluate prototype cameras assemblies against the camera source control drawings for compliance. Assess additional EO3 obsolescence issues that require resolution to sustain readiness until EO3 sundown. Conduct research and development of next generation EO alternatives. ***FY 2018 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue to develop, integrate, and evolve enhanced test capabilities and technologies for insertion into the CASS family of test systems with an increased focus on development and evaluation of next generation EO solutions for the replacement of the CASS EO3 console. ***FY 2018 OCO Plans:*** N/A					
Title: EO3 Technology Development	0.000	0.000	4.279	0.000	4.279
Articles:	-	-	2	-	2
Description: This project will develop, integrate and test technical solutions to resolve EO3 obsolescence issues, including a near infrared camera, that are capable of supporting the maintenance and repair of the F/A-18 ATFLIR and H-60 MTS weapon systems. ***FY 2016 Accomplishments:*** N/A ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** Integrate two prototype near infrared camera assemblies into the EO3 system. Perform EO3 system design verification testing against the system specification requirements for compliance. Research and analyze solutions for other EO3 obsolescence resolution requirements. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	6.382	6.494	6.661	0.000	6.661

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• APN/0705: *Common Ground Equipment-CASS/ATE*	130.917	110.114	104.170	-	104.170	112.606	112.947	121.384	123.813	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

D. Acquisition Strategy

Formal test technology reviews with industry are conducted annually (cooperative Joint Services initiative) to define maturity of needed technologies. Further studies are conducted as needed. Procurement strategy is determined by market survey and cooperative opportunities.

E. Performance Metrics

Milestone Reviews

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1041 / *Acft Equip Repl/Maint Prog*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
1041: *Acft Equip Repl/Maint Prog*	46.599	3.400	3.245	3.356	-	3.356	3.383	3.502	3.587	3.657	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP) is the only Navy program which provides Research, Development, Test & Evaluation engineering support specifically for in-service, out-of-production aircraft equipment. AERMIP increases readiness through reliability, maintainability, and safety improvements to existing systems and equipment installed in Naval aircraft. It also provides a transition vehicle to deploy Total Ownership Cost reduction initiatives through flight-test support and Fleet Test & Evaluation. It meets affordable readiness objectives by providing a cost-effective solution to obsolescence problems encountered when service lives are extended. AERMIP promotes commonality and standardization across aircraft platform lines and among the services through extension of application and use of non-developmental items. AERMIP also decreases life cycle costs through reduced operational and support costs. AERMIP facilitates the Operational, Safety and Improvement Program by applying proven low-risk solutions to current fleet problems. AERMIP also funds high-priority flight testing which is not associated with any acquisition or development program under the Flight Test General task.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Avionics and Wiring	0.325	0.564	0.379	0.000	0.379
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Continue pursuit of technology advances in ultra-high density power storage from industry. Address avionics related reliability/ maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation. Continue to review and investigate high speed data connector reliability in aircraft subsystems.					
FY 2017 Plans: Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Address avionics related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation.					
FY 2018 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Address avionics related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation. ***FY 2018 OCO Plans:*** N/A					
Title: Air Vehicle	2.060	2.071	2.060	0.000	2.060
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Provide human factors focus to improve maintainability through enhanced maintainer performance. Begin development of sensor fusion for advanced prognostics with focus on low cost and reduced labor procedures that can be done in fleet environments. Continue to qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of cold spray component repair. ***FY 2017 Plans:*** Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Continue to test and qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of structural component repair. ***FY 2018 Base Plans:*** Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Continue to test and qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of structural component repair. ***FY 2018 OCO Plans:*** N/A					
Title: Systems Engineering Revitalization	1.015	0.610	0.917	0.000	0.917

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Articles:	-	-	-	-	-
FY 2016 Accomplishments: First, continue improvements in the System Engineering (SE) Technical Review process through model-centric analysis and design techniques in an attempt to shorten acquisition timelines and "Speed to the Fleet" at the system program of record level. Second, correct any deficiencies in the conversion to web-based checklist tool, implement tool in Secret Internet Protocol Router Network, and execute future upgrades. Third, update checklist questions to account for ever changing policy direction and streamline across the acquisition lifecycle to focus the review on its core elements. ***FY 2017 Plans:*** First, continue improvements in the Systems Engineering (SE) Technical Review (SETR) process by implementing model-centric SE policies, methods, and tools. Second, continue SETR checklist content improvements and improve SETR Manager tool to assist in dissemination of SE policy, SE tools, checklists, and associated training. Third, develop and improve an SE requirements tool and the integrated SE environment. ***FY 2018 Base Plans:*** Continue with improvements in the current SE process and transition to model-centric systems engineering methodology (SE transformation). This transformation evolution requires updates to process, methods, tools, and training. Associated products include evolving SETR checklist to a model-centric design assessment framework and continuing the development and deployment of the web-based collaborative SE toolset (Integrated System Engineering Environment). ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.400	3.245	3.356	0.000	3.356

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*

E. Performance Metrics

The Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP) program will, at a minimum, fund 8 to 15 projects a year that investigate and evaluate reliability and maintainability improvements to in-service, out-of-production aircraft equipment. AERMIP projects will have a greater than 75% success rate of insertion into Department of the Navy warfighting systems or support infrastructure.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
1355: *Propulsion and Power Component Improvement Program*	980.412	73.811	93.543	94.001	-	94.001	105.965	106.482	106.081	108.207	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Propulsion and Power (P&P) Component Improvement Program (CIP) provides the only source of critical design and development engineering support to resolve safety, reliability and maintainability deficiencies of in-service Navy and Marine Corps aircraft propulsion systems. The highest priority issues P&P CIP addresses concern safety-of-flight deficiencies, which account for approximately 80% of P&P CIP efforts. The program also corrects service-revealed deficiencies, improves Operational Readiness and Reliability and Maintainability, and reduces platform Life Cycle Cost. Budgets are allocated across platform-specific teams and multi-platform product support teams based upon long term strategies to achieve safety and affordable readiness goals; the R-3 exhibit details annual portions of those long-term strategies. P&P CIP tasks have reduced the rate of in-flight aborts, safety incidents, non-mission capable rates, scheduled and unscheduled engine removals, maintenance work hours, and overall cost of ownership. This is accomplished through the maintenance and validation of specification performance, testing to qualify engineering changes, verifying life limits, and improving the inherent reliability of the propulsion and power systems as an integral part of Reliability Centered Maintenance initiatives. Historically, the missions, tactics, and environmental exposure of military aircraft systems change to meet new threats or operational demands, and often result in unforeseen problems, which if not corrected, can cause critical safety/readiness degradation, such as those experienced during OPERATIONS DESERT SHIELD/DESERT STORM, ENDURING FREEDOM, and IRAQI FREEDOM due to sand erosion. In addition, new problems arise through actual fleet deployment and usage of the aircraft. System development programs, while geared to resolve as many problems as possible before deployment, cannot duplicate actual operations or account for the vast array of environmental and usage variables, particularly when aircraft missions vary from those that the aircraft was designed to perform. Therefore, it has been found that P&P CIP can provide an immediate engineering response to these flight-critical problems and accelerated engine testing can avoid potential problems. P&P CIP starts after development and Navy acceptance of the first production article and addresses usage and life problems not covered by warranties. P&P CIP addresses engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, aircraft wiring, and fuel and lubricant systems. These efforts continue over the system's life, gradually decreasing to a minimum level sufficient to maintain the reliability, and decrease the operating costs, of older inventory. P&P CIP is a highly leveraged and cooperative tri-service program with Foreign Military Sales participation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: P3, E2, C2, C130 (T56)	7.051	9.423	11.000	0.000	11.000
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Complete prop shaft repair qualification effort and release repair to depot. Complete turbine clearance effort and release new limits to depot. Begin effort to evaluate pull-criteria and standardize engine performance					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
measurement to ensure consistent, reliable, and accurate results are achieved by operators. Complete incorporation of scavenge filter assemblies and Y-fittings to alleviate oil loss caused by high scavenge back pressure. Complete engine qualification testing and submit engineering changes for production 3-4 turbine spacer, propeller brake redesign, planet gear bearing assembly, front turbine bearing cage, and front turbine bearing support redesigns. Complete reduction gearbox qualification testing for propeller brake redesign to improve reliability. ***FY 2017 Plans:*** Complete engine qualification testing for planet gear bearing assembly. Initiate qualification testing for combustion liner, front turbine bearing cage, and front turbine bearing support redesigns. Submit engineering change for production planet gear bearing assembly. ***FY 2018 Base Plans:*** Complete bench testing and qualification testing on front turbine bearing cage, front turbine bearing support and combustor liner redesigns. Execute engine Accelerated Mission Test. Submit engineering change for combustor liner redesign. Initiate development and design of updated software for the propulsion control and monitoring unit to correct identified deficiencies. ***FY 2018 OCO Plans:*** N/A					
Title: E2/C2/C130/P3 (Props)	2.000	2.130	1.500	0.000	1.500
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Complete fleet incorporation of the NP2000 feather modification to eliminate a failure mode that caused an E-2C mishap. Begin fleet introduction of the NP2000 modernized pump housing and the actuator valve module with new transfer tube configuration. Begin field service evaluation of NP2000 blade erosion protection film. Continue fleet incorporation of NP2000 front spinner with repairable mounting hole. Begin field service evaluation of a new propeller anti/de-icing brush block for the C-130 and P-3 propeller. ***FY 2017 Plans:*** Complete fleet incorporation of the NP2000 feather modification to eliminate a safety issue. Begin field service evaluation of NP2000 blade erosion protection film. Begin fleet introduction of the NP2000 modernized pump housing and the actuator valve module with new forward housing configuration. Begin fleet incorporation of NP2000 front spinner with repairable mounting hole. Begin field service evaluation of a new propeller anti/de-					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
icing brush block for the C-130 and P-3 propeller. Continue design work and begin testing of C-130 54H60-111 modernized pump housing. ***FY 2018 Base Plans:*** Complete design and submit engineering change for 54H60 propeller brake lining obsolescence redesign. Complete field service evaluation and submit engineering change for NP2000 variable pitch actuator transfer tube seal improvement redesign. ***FY 2018 OCO Plans:*** N/A					
Title: EA-6B (J52) ***Articles:*** ***FY 2016 Accomplishments:*** Implement and continue updating repair and inspection criteria for fielded components. Manage parts obsolescence issues. ***FY 2017 Plans:*** N/A ***FY 2018 Base Plans:*** N/A ***FY 2018 OCO Plans:*** N/A	0.693 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: SH-60B/F, HH-60H, MH-60R/S (T700) ***Articles:*** ***FY 2016 Accomplishments:*** Continue redesign work to reduce impact of cost and readiness drivers for the T700 engine. Complete T700 accelerated simulated mission endurance testing to demonstrate newly redesigned ceramic matrix composite shrouds and cutback diffuser. Continue lithium battery qualification. Complete air turbine starter qualification. ***FY 2017 Plans:*** Continue redesign work to reduce impact of cost and readiness drivers for the T700 engine. Conduct T700 accelerated simulated mission endurance testing to demonstrate newly redesigned ceramic matrix composite	3.333 -	4.314 -	5.678 -	0.000 -	5.678 -

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
shrouds. Continue lithium battery qualification. Continue development of Black Gold environmental coating system. ***FY 2018 Base Plans:*** Continue redesign work to reduce impact of cost and readiness drivers for the T700 engine. Conduct lithium battery qualification safety and performance testing. Complete test planning in preparation for an engine accelerated simulated mission endurance test and saltwater ingestion test to qualify Black Gold compressor coating. ***FY 2018 OCO Plans:*** N/A					
Title: H-1 (T400/T700)	0.700	1.000	0.431	0.000	0.431
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Continue support of common T700 engine and air turbine starter projects. Complete project to address obsolescence for non-volatile random access memory chip in T700-401C Digital Engine Control Unit. ***FY 2017 Plans:*** Continue support of common T700 engine and air turbine starter projects. Conduct AH-1W starter improvement project. Complete main rotor gearbox oil filter relocation project. ***FY 2018 Base Plans:*** Redesign the air vehicle tail rotor flexible coupling to a non-lubricated design to improve reliability. Update subsystem support planning based on evaluation of maintenance task improvements, service-revealed deficiencies, and emergent issues from fleet operational usage on all propulsion and power subsystems, including engine, auxiliary power unit, fuel, electrical power, and wiring. ***FY 2018 OCO Plans:*** N/A					
Title: AV-8B (F402)	5.483	6.163	3.849	0.000	3.849
Articles:	-	-	-	-	-
FY 2016 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Complete tasking for application of low plasticity burnishing on low pressure compressor stage two and three blades. Redesign #4 bearing insulating blanket. Update engine performance deterioration study. Assess mission profile analysis for life management plan update. ***FY 2017 Plans:*** Continue engine performance monitoring program. Complete low pressure turbine vane platform cracking, exhaust duct manifold cracking, and combustion chamber inner subassembly cracking tasks. Update critical rotating part life predictions based upon updated mission profiles. ***FY 2018 Base Plans:*** Continue working on risk management plan of supplying critical parts and refinement of life limit determinations and identification of critical parts constraints. Continue efforts to identify alternate parts and vendors for consumable hardware. ***FY 2018 OCO Plans:*** N/A					
Title: H-53/H-46/H-3 (T58/T64)	4.437	5.884	4.530	0.000	4.530
Articles:	-	-	-	-	-
FY 2016 Accomplishments: H-46/H-3 (T58) Continue to develop inspection and repair criteria for fielded components. H-53 (T64) Continue life management analysis and reliability centered maintenance efforts. Continue to develop inspection and repair criteria for fielded components. Continue cost of ownership reduction programs. Qualify and implement accessory gearbox free-wheel unit lubrication design improvement. Complete main rotor shaft low-cycle fatigue analysis. ***FY 2017 Plans:*** H-46/H-3 (T58) Continue to develop inspection and repair criteria for fielded components. H-53 (T64) Continue life management analysis and reliability centered maintenance efforts. Continue to develop inspection and repair criteria for fielded components. Continue cost of ownership reduction programs. Qualify and					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
implement accessory gearbox free-wheel unit lubrication design improvement. Complete main rotor shaft low-cycle fatigue analysis. ***FY 2018 Base Plans:*** Continue to develop inspection and repair criteria for fielded components and optimization of depot-level engine build practices and procedures to increase engine performance. Continue updates of engine mission usage and engine critical hardware life management plans. Evaluate engine fuel nozzle candidate anti-coking coatings to improve fuel nozzle durability. ***FY 2018 OCO Plans:*** N/A					
Title: F-18 C/D/E/F (F414/F404)	15.414	14.958	16.926	0.000	16.926
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Complete U.S. Navy F404 mission analysis and assess changes to part lives. Complete engine pressure ratio measurement accuracy improvement and develop an implementation strategy. Reduce non-recoverable in-flight shutdown by identifying key contributors and addressing the top five reasons. Reduce in-flight aborts by identifying key contributors and addressing the top five reasons. Monitor test cell performance reports from fleet and assess changes required. Finalize design for removing life limit main fuel manifold, complete outer bypass duct (OBD) delamination preliminary design, and complete and implement OBD improved anchor nut durability. Complete preliminary design and down-select candidate to improve N2 shroud durability, complete preliminary design, down-select candidate to eliminate Variable Exhaust Nozzle (VEN) actuator wear/binding, and test and verify full-authority digital electronic control 4NH software changes to reduce stalls. Redesign VEN boost pump rear cover to eliminate a life limit, improve fuel tube Rosan joint fittings to eliminate external fuel leaks, and identify oil system improvements to reduce unscheduled removals. ***FY 2017 Plans:*** Update stress analysis models to extend the lives of the combustion case, low-pressure turbine (LPT) disk, and stage 1 fan rotor. Complete preliminary design and start detail design to down-select the field repair for fan case rubber damage. Test and verify that the main fuel manifold is no longer life-limited. Complete high-pressure turbine blade preliminary design, and down-select a design to address service distress causes for removal. Complete LPT shrouds preliminary design, and down-select a design to allow for field replacement. Complete test and verification of Rosan joint fittings and release to the fleet. Complete preliminary design, and down-select the fuel actuator engineering test bench design. Conduct tests to characterize influences and interactions, and					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
confirm causes for VEN binding. Test and verify that blade dovetail coatings meet service use requirements. Evaluate oil consumption limits, and down-select designs to oil system components that reduce in-flight aborts. Explore the use of surface treatments on static components to allow for extended service use. Reassess the engine build window to identify ownership costs reductions. ***FY 2018 Base Plans:*** Continue F404 engine electrical control assembly obsolescence redesign. Develop an improved engine vibration measurement system to increase measurement accuracy at fleet test cells. Continue evaluation and testing of alternate engine fan blade dovetail coatings to improve component durability. Perform rotor spin testing of engine fan hardware to verify the low cycle fatigue life benefit of the low plasticity burnishing surface treatment. Apply data analytics tools to engine reliability data sets to identify engine removal driver causes. Complete design efforts to extend the life of the F414 engine main fuel manifold. Continue redesign of the high-pressure turbine blades to reduce the frequency of unscheduled engine removals. Continue design of improved oil system components and architecture to reduce in-flight mission abort rates. Continue investigation of engine variable exhaust nozzle hydro-mechanical failure events. Continue analysis and evaluation of composite outer bypass duct delamination. ***FY 2018 OCO Plans:*** N/A					
Title: T-45 (F405) ***Articles:***	2.321 -	4.723 -	3.021 -	0.000 -	3.021 -
FY 2016 Accomplishments: Continue redesign work to reduce impact of cost and readiness drivers for the F405 engine based on service revealed deficiencies and address safety issues reported from fleet. Complete high pressure compressor seal redesign to improve performance retention, and reduce scrap rate at overhaul. Complete high and low pressure turbine seal redesign to improve safety and performance retention, and reduce scrap rate at overhaul. Initiate high pressure turbine redesign to reduce scrap rate at overhaul. Initiate comparison of flight profiles and engine duty cycles between T-45 operating sites to evaluate differences in engine rejection causes and parts usage. ***FY 2017 Plans:*** Continue redesign work to reduce impact of cost and readiness drivers for the F405 engine based on service revealed deficiencies, and address safety issues reported from fleet. Complete component endurance testing of low-pressure compressor blade improvements to mitigate blade root cracking in-service and reduce scrap rate at overhaul. Complete redesign of engine correct rotation system to reduce high failure rate and reduce cost					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
of ownership. Complete high-pressure turbine and low-pressure turbine seal redesign to improve safety and performance retention, and reduce scrap rate at overhaul. Complete high-pressure compressor seal redesign to improve safety and performance retention, and reduce scrap rate at overhaul. Initiate root cause investigation of perceived installed engine vibrations to reduce high rejection rate and cost of ownership. Initiate study to identify engine future obsolescence areas. Complete effort to extend fatigue life of high-pressure turbine and low-pressure turbine discs using new material data to reduce cost of ownership. ***FY 2018 Base Plans:*** Continue redesign work to reduce impact of cost and readiness drivers for the F405 engine based on service revealed deficiencies and address safety issues reported from fleet. Initiate component level rotor spin testing of the low pressure compressor to verify the ability of the improved blade dovetail coating system to mitigate blade cracking under high-cycle fatigue excitation conditions. Perform assessment of engine cyclic usage rates at the Kingsville and Meridian sites to update critical rotating engine part lives. Continue study to identify mitigation approaches to address propulsion and power system component obsolescence issues. ***FY 2018 OCO Plans:*** N/A					
Title: V-22 Propulsion	2.893	3.392	4.236	0.000	4.236
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Implement nacelle blower and machined impellers design changes. Validate engine control hardware-in-the-loop (HWIL) simulation with updated engine control software and transition to "Software" full authority digital engine control to reduce future costs of maintaining the HWIL capability. Continue development of monitoring algorithms and addition of high frequency vibration monitoring to drive system gearboxes for trend monitoring. Continue prop rotor gearbox design improvements to reduce disengagement events. Improve engine air particle separator scavenge flow to decrease sand ingestion into the engine for additional engine reliability. Produce and conduct verification testing for several potential design solutions that are intended to mitigate sand accumulation in the turbine. ***FY 2017 Plans:***					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop improvements for the K8/K9 relays to reduce K8/K9, regulator converter unit, and auxiliary power unit starter failures. Develop an improved power assurance check for the engines to ensure accurate assessment of engine health. ***FY 2018 Base Plans:*** Prepare for full-scale engine testing to mitigate rapid power loss and engine surge events that have occurred during reduced visibility landing operations to increase flight safety. Complete update of engine critical part lives and engine life management plan based on updated mission mix usage requirements. Perform redesign to improve prop rotor input quill clutch system robustness to address known failure modes. Continue efforts to improve accuracy of the in-flight power assurance check to improve mission planning capability. ***FY 2018 OCO Plans:*** N/A					
Title: Adversary (J85) (F100)	1.023	1.434	2.660	0.000	2.660
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Continue contributing to the J85 and F100 common Component Improvement Program (CIP) with the U.S. Air Force (USAF) and Foreign Military Sales group. Perform validation and life assessment of life cycle fatigue components, including hardware inspection data, mission mix analysis, advanced fracture mechanics, and stress models to provide a revised J85 life cycle fatigue life update. Investigate and approve a turbine nozzle activated diffusion healing repair procedure, and support equipment upgrades and other repair procedures. Approve F100 main fuel control seal durability improvement, first blade/second stage vane durability improvement, and combustion chamber stiffener improvement. Analyze CIP benefits, updated mission, and components life extension. ***FY 2017 Plans:*** Continue contributing to the J85 and F100 common CIP with the USAF and Foreign Military Sales group. Perform validation and life assessment of life cycle fatigue components, including hardware inspection data and stress models to provide a revised J85 life cycle fatigue life update. Implement an upgraded modification of the engine performance monitoring system for future mission analysis. Investigate and approve a stage 2 turbine nozzle design that mitigates cracking due to oxidation. Develop support equipment and engine repair procedures that will improve maintainability and extend the useful life of parts. Approve F100 main fuel control					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
seal durability improvement, first blade/second stage vane durability improvement, and combustion chamber stiffener improvement. Analyze CIP benefits, updated mission, and components life extension. ***FY 2018 Base Plans:*** Continue contributing to the J85 and F100 common CIP with the USAF and Foreign Military Sales customers. Continue validation and life assessment of J85 life limited critical rotating hardware in the compressor including front and rear spools and turbine including stage 1 and stage 2 disks. Evaluate hardware inspection data, and perform stress modeling to update low cycle fatigue life limits. Implement an upgraded modification of the engine performance monitoring system for future mission analysis. Implement J85 improved turbine thermocouple probe and harness redesign to reduce engine performance related removals driven by harness failures. ***FY 2018 OCO Plans:*** N/A					
Title: Joint Strike Fighter (F135 Engine)	21.980	30.479	32.861	0.000	32.861
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Continue to work with Joint Program Office and U.S. Air Force (USAF) to prioritize and develop engineering project descriptions that resolve Fleet revealed deficiencies that are not part of system development. In concert with the USAF, support Joint service Lead-the-Fleet (LTF) engine testing on the conventional takeoff and landing/aircraft carriers system. Continue the procurement of the short takeoff/vertical landing hardware to initiate LTF testing. ***FY 2017 Plans:*** Continue to work with Joint Program Office and USAF to prioritize and develop engineering project descriptions that resolve Fleet revealed deficiencies that are not part of system development. In concert with the USAF, support Joint service LTF engine testing on the conventional takeoff and landing/aircraft carriers system. Continue the procurement of the short takeoff/vertical landing hardware to initiate LTF testing. ***FY 2018 Base Plans:*** Continue to work with Joint Program Office, USAF, international partners, and foreign military sales customers to prioritize and develop engineering project descriptions that resolve flight test and fleet service revealed deficiencies. In concert with the USAF, support joint service engine accelerated simulated mission endurance testing and LTF engine testing on the conventional takeoff and landing propulsion system. Prepare for the					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
short takeoff/vertical landing accelerated simulated mission endurance testing with hardware improvements to demonstrate continued durability improvement. ***FY 2018 OCO Plans:*** N/A					
Title: P-8A (CFM56 Engine)	1.150	1.150	0.500	0.000	0.500
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Develop out-year program engine management planning and operational/readiness metric baselines. Develop engine operational usage mission spectrum for use in original equipment manufacturer (OEM) engine life-limited component updates. Perform maturation of engine management planning activities with inputs from age exploration tasks: field service bore-scoping of high-time engines, engine component part condition assessments on first engine depot inductions and continued review of operational usage data. Evaluate leading indicators, service-revealed deficiencies, and emergent issues from fleet operational usage on all subsystems (engine, auxiliary power unit, fuel, electrical, electrical wiring). Evaluate OEM partial cycle analysis for use with engine life limited parts.					
FY 2017 Plans: Mature out-year program engine management planning and updates to operational/readiness metric baselines informed by further age-exploration results from post-deployment bore-scope inspections, engine depot part condition assessment, and operational usage data. Continue age exploration via post-deployment bore-scope inspections, engine depot part condition assessment, and operational usage data. Evaluate impact of high altitude antisubmarine warfare introduced under P-8A Increment 2 engineering change proposals on engine mission usage. Mature subsystem planning based on evaluation leading indicators, age exploration, maintenance task improvements, service-revealed deficiencies, and emergent issues from fleet operational usage on all subsystems (engine, auxiliary power unit, fuel, electrical, electrical wiring). Evaluate incremental progress of original equipment manufacturer life limit extension analysis on engine life limited parts.					
FY 2018 Base Plans: Mature out-year program engine management planning and updates to operational and readiness metric baselines and mature subsystem support planning based on evaluation of leading indicators, age exploration results, maintenance task improvements, service-revealed deficiencies, and emergent issues from fleet					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
operational usage on all propulsion and power subsystems, including engine, auxiliary power unit, fuel, electrical power, and wiring. ***FY 2018 OCO Plans:*** N/A					
Title: Multi-Platform Product Support Teams	5.333	8.493	6.809	0.000	6.809
Articles:	-	-	-	-	-
FY 2016 Accomplishments: Continue projects to provide common support to multiple platforms in the areas of improved drive systems, secondary power, and mechanical systems; improve tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improve products and processes for fuels, lubricants, and refueling equipment; and improve electrical system product support, wiring, and battery systems. Includes funding for Government Furnished Equipment fuel provided in support of engine developmental and qualification testing. Study data system solutions for the Naval Power Avionics Thermal and Hydraulics Lab and install full control system solution. Provide support for growing modeling capability with large storage solutions for the research, development, test, and evaluation connected devices. ***FY 2017 Plans:*** Continue projects to provide common support to multiple platforms in the areas of improved drive systems, secondary power, and mechanical systems; improve tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improve products and processes for fuels, lubricants, and refueling equipment; and improve electrical system product support, wiring, and battery systems. Includes funding for Government Furnished Equipment fuel provided in support of engine developmental and qualification testing. Study data system solutions for the Naval Power Avionics Thermal and Hydraulics Lab and install full control system solution. Provide support for growing modeling capability with large storage solutions for the research, development, test, and evaluation connected devices. ***FY 2018 Base Plans:*** Continue projects to provide common support to multiple platforms in the areas of improved drive systems, secondary power, and mechanical systems; improve tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improve products and processes for fuels, lubricants, and refueling equipment; and improve electrical system product support, wiring, and battery systems.					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Includes funding for Government Furnished Equipment fuel provided in support of engine developmental and qualification testing. ***FY 2018 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	73.811	93.543	94.001	0.000	94.001

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a NON-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

E. Performance Metrics

The Propulsion and Power Component (P&P) Improvement Program (CIP) will support engineering design and development efforts for 100% of the safety of flight issues on in-service propulsion and power systems covered under the program. Over the past two years, this equated to more than 275 individual Engineering Project Descriptions (EPDs). P&P CIP will also address reliability and maintainability deficiencies equating to at least another 100 individual EPDs. Similar projects have increased the aggregate engine reliability across the USN/USMC fleet, as measured by the mean flight hours between engine removals, by 40% over the past eight years.

Program execution will be actively managed on 100% of the projects via contractor earned value data and overall obligation and expenditure rates as reflected in Navy ERP. Data will be analyzed and measured against OSD/FMB benchmarks on a monthly basis.

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Eng T56 Engine Program	WR	NAWCAD : Patuxent River, MD	34.967	3.500	Nov 2015	4.500	Nov 2016	4.153	Nov 2017	-		4.153	Continuing	Continuing	Continuing
Sys Eng T56 Engine Program	SS/CPFF	Rolls Royce : Indianapolis, IN	49.671	2.821	Feb 2016	4.113	Jan 2017	5.973	Jan 2018	-		5.973	0.000	62.578	63.045
Sys Eng T56 Engine Program	WR	FRC-E : Cherry Point, NC	1.698	0.692	Nov 2015	0.750	Nov 2016	0.810	Nov 2017	-		0.810	Continuing	Continuing	Continuing
Sys Eng T56 Engine Program	WR	FRC-SE : Jacksonville, FL	0.837	0.038	Nov 2015	0.010	Nov 2016	0.011	Nov 2017	-		0.011	Continuing	Continuing	Continuing
Sys Eng T56 Engine Program	WR	FRC-SW : North Island, CA	0.075	0.000		0.050	Nov 2016	0.053	Nov 2017	-		0.053	Continuing	Continuing	Continuing
Sys Eng Props Program	SS/CPFF	Hamilton Sundstrand : Windsor Locks, CT	24.035	2.000	May 2016	2.130	Jan 2017	1.500	Jan 2018	-		1.500	0.000	29.665	30.395
Sys Eng J52 Engine Program	WR	NAWCAD : Patuxent River, MD	14.129	0.300	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Sys Eng J52 Engine Program	SS/CPFF	UTC Pratt & Whitney : East Hartford, CT	41.205	0.240	Jan 2016	0.000		0.000		-		0.000	0.000	41.445	41.445
Sys Eng J52 Engine Program	WR	FRC-E : Cherry Point, NC	0.085	0.003	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Sys Eng J52 Engine Program	WR	FRC-SE : Jacksonville, FL	0.275	0.150	Nov 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Sys Eng T700 Engine Program	WR	NAWCAD : Patuxent River, MD	14.741	1.500	Nov 2015	1.500	Nov 2016	2.186	Nov 2017	-		2.186	Continuing	Continuing	Continuing
Sys Eng T700 Engine Program	SS/CPFF	General Electric : Lynn, MA	30.528	1.683	Dec 2015	2.814	Jan 2017	3.492	Jan 2018	-		3.492	0.000	38.517	38.517
Sys Eng T700 Engine Program	IA	Army Research Lab : Aberdeen Proving Ground, MD	0.000	0.150	Jan 2016	0.000		0.000		-		0.000	0.000	0.150	-
Sys Eng T400 Engine Program	WR	NAWCAD : Patuxent River, MD	1.467	0.700	Nov 2015	1.000	Nov 2016	0.431	Nov 2017	-		0.431	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component Improvement Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Eng T400 Engine Program	SS/CPFF	UTC Pratt & Whitney : East Hartford, CT	5.890	0.000		0.000		0.000		-		0.000	0.000	5.890	5.890
Sys Eng F402 Engine Program	WR	NAWCAD : Patuxent River, MD	17.687	1.750	Nov 2015	1.677	Nov 2016	1.693	Nov 2017	-		1.693	Continuing	Continuing	Continuing
Sys Eng F402 Engine Program	WR	NAWCWD : China Lake, CA	0.000	0.303	Apr 2016	0.000		0.000		-		0.000	0.000	0.303	-
Sys Eng F402 Engine Program	WR	FRC-E : Cherry Point, NC	0.642	0.255	Nov 2015	0.050	Nov 2016	0.105	Nov 2017	-		0.105	Continuing	Continuing	Continuing
Sys Eng F402 Engine Program	MIPR	DTIC : Fort Belvoir, VA	0.000	0.028	Jan 2016	0.000		0.000		-		0.000	0.000	0.028	-
Sys Eng F402 Engine Program	SS/CPFF	Rolls Royce : Bristol, England, UK	73.229	2.302	Feb 2016	4.436	Jan 2017	2.051	Jan 2018	-		2.051	0.000	82.018	83.425
Sys Eng F402 Engine Program	C/FFP	Hood Technology Corp : Hood River, OR	0.000	0.845	Apr 2016	0.000		0.000		-		0.000	0.000	0.845	0.845
Sys Eng T58/T64 Engine Program	WR	NAWCAD : Patuxent River, MD	33.079	1.750	Dec 2015	2.150	Nov 2016	2.501	Nov 2017	-		2.501	Continuing	Continuing	Continuing
Sys Eng T58/T64 Engine Program	SS/CPFF	General Electric : Lynn, MA	84.108	2.538	Jan 2016	3.734	Jan 2017	2.029	Jan 2018	-		2.029	0.000	92.409	92.409
Sys Eng T58/T64 Engine Program	C/FFP	Danobat Machine Tool Co. : Humble, TX	0.000	0.149	May 2016	0.000		0.000		-		0.000	0.000	0.149	0.149
Sys Eng F414/F404 Engine Program	WR	NAWCAD : Patuxent River, MD	36.675	5.500	Nov 2015	5.500	Nov 2016	6.009	Nov 2017	-		6.009	Continuing	Continuing	Continuing
Sys Eng F414/F404 Engine Program	SS/CPFF	General Electric : Lynn, MA	139.806	9.862	Dec 2015	9.208	Jan 2017	10.649	Jan 2018	-		10.649	0.000	169.525	169.525
Sys Eng F414/F404 Engine Program	WR	FRC-SE : Jacksonville, FL	0.533	0.052	Feb 2016	0.250	Nov 2016	0.268	Nov 2017	-		0.268	Continuing	Continuing	Continuing
Sys Eng F405 Engine Program	WR	NAWCAD : Patuxent River, MD	9.337	1.250	Nov 2015	3.208	Nov 2016	1.448	Nov 2017	-		1.448	Continuing	Continuing	Continuing
Sys Eng F405 Engine Program	SS/CPFF	Rolls Royce : Bristol, England, UK	33.617	1.071	Apr 2016	1.515	Jan 2017	1.573	Jan 2018	-		1.573	0.000	37.776	39.237

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Eng V-22 Propulsion Program	WR	NAWCAD : Patuxent River, MD	0.135	0.650	Nov 2015	0.892	Nov 2016	0.961	Nov 2017	-		0.961	Continuing	Continuing	Continuing
Sys Eng V-22 Propulsion Program	SS/FFP	Bell- Boeing : Ft. Worth, TX	6.779	0.100	Aug 2016	2.000	Jan 2017	1.775	Jan 2018	-		1.775	0.000	10.654	11.029
Sys Eng V-22 Propulsion Program	SS/CPFF	Rolls Royce : Indianapolis, IN	0.080	1.500	Jul 2016	0.500	Jan 2017	2.000	Jan 2018	-		2.000	0.000	4.080	4.590
Sys Eng V-22 Propulsion Program	C/FFP	Nat'l Center for Manuf'g Sciences : Ann Arbor, MI	0.000	0.166	Feb 2016	0.000		0.000		-		0.000	0.000	0.166	0.166
Sys Eng V-22 Propulsion Program	C/FFP	Univ of Dayton Research Inst. : Dayton, OH	0.000	0.040	May 2016	0.000		0.000		-		0.000	0.000	0.040	0.040
Sys Eng V-22 Propulsion Program	MIPR	Army Research Lab : Aberdeen Proving Ground, MD	0.000	0.299	Jan 2016	0.000		0.000		-		0.000	0.000	0.299	-
Sys Eng V-22 Propulsion Program	C/CPFF	UTC Pratt & Whitney : East Hartford, CT	0.000	0.138	Aug 2016	0.000		0.000		-		0.000	0.000	0.138	0.138
Sys Eng Adversary J85 Engine Program	WR	FRC-SE : Jacksonville, FL	0.038	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Sys Eng Adversary J85 Engine Program	WR	NAWCAD : Patuxent River, MD	1.936	0.660	Nov 2015	1.034	Nov 2016	1.430	Nov 2017	-		1.430	Continuing	Continuing	Continuing
Sys Eng Adversary J85 Engine Program	SS/CPFF	General Electric : Lynn, MA	1.772	0.280	Apr 2016	0.400	Jan 2017	1.230	Jan 2018	-		1.230	0.000	3.682	3.682
Sys Eng Adversary J85 Engine Program	C/FFP	UTC Military Engines : East Hartford, CT	0.000	0.083	Apr 2016	0.000		0.000		-		0.000	0.000	0.083	0.083
Sys Eng JSF Engine Program	WR	NAWCAD : Patuxent River, MD	5.000	0.977	Nov 2015	1.000	Nov 2016	1.000	Nov 2017	-		1.000	Continuing	Continuing	Continuing
Sys Eng JSF Engine Program	SS/FFP	UTC Pratt & Whitney : East Hartford, CT	0.000	21.000	Aug 2016	29.479	Jan 2017	31.660	Jan 2018	-		31.660	0.000	82.139	82.139

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Sys Eng JSF Engine Program	WR	FRC-E : Cherry Point, NC	0.000	0.003	Dec 2015	0.000		0.201	Nov 2017	-		0.201	0.000	0.204	-
Sys Eng P-8A Engine Program	WR	NAWCAD : Patuxent River, MD	0.000	1.150	Nov 2015	1.150	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Sys Eng Lab Fld Activity-1.0 or more	WR	NAWCAD : Patuxent River, MD	204.512	4.578	Nov 2015	7.695	Nov 2016	6.448	Nov 2017	-		6.448	Continuing	Continuing	Continuing
Sys Eng Other In-House Spt	Various	Various : Various	20.417	0.000		0.200	Nov 2016	0.210	Nov 2017	-		0.210	Continuing	Continuing	Continuing
GFE*	Reqn	DES/DLA : Various	13.742	0.000		0.200	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Prod Dev costs no longer funded in the FYDP	Various	Various : Various	62.882	0.000		0.000		0.000		-		0.000	0.000	62.882	-
		Subtotal	965.609	73.056		93.145		93.850		-		93.850	-	-	-

Remarks

GFE includes expected cost of fuel necessary to support engine development and qualification testing.
Total may be off due to rounding.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	Various : Various	8.000	0.000		0.300	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Development Support	WR	FRC-SW : North Island, CA	0.613	0.210	Oct 2015	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Development Support	WR	FRC-E : Cherry Point, NC	0.105	0.350	Oct 2015	0.000		0.000		-		0.000	0.000	0.455	-
Development Support	WR	NSWC : Crane, IN	0.000	0.160	Dec 2015	0.000		0.100	Nov 2017	-		0.100	0.000	0.260	-
		Subtotal	8.718	0.720		0.300		0.100		-		0.100	-	-	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component Improvement Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	Various	Various : Various	3.392	0.000		0.050	Nov 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NSWC : Crane, IN	0.548	0.000		0.000		0.000		-		0.000	0.000	0.548	-
		Subtotal	3.940	0.000		0.050		0.000		-		0.000	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	NAVAIR : Patuxent River, MD	0.698	0.035	Oct 2015	0.048	Oct 2016	0.051	Oct 2017	-		0.051	Continuing	Continuing	Continuing
Prior Year Mgmt cost no longer funded in the FYDP	Various	Various : Various	1.447	0.000		0.000		0.000		-		0.000	0.000	1.447	-
		Subtotal	2.145	0.035		0.048		0.051		-		0.051	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	980.412	73.811		93.543		94.001		-		94.001	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

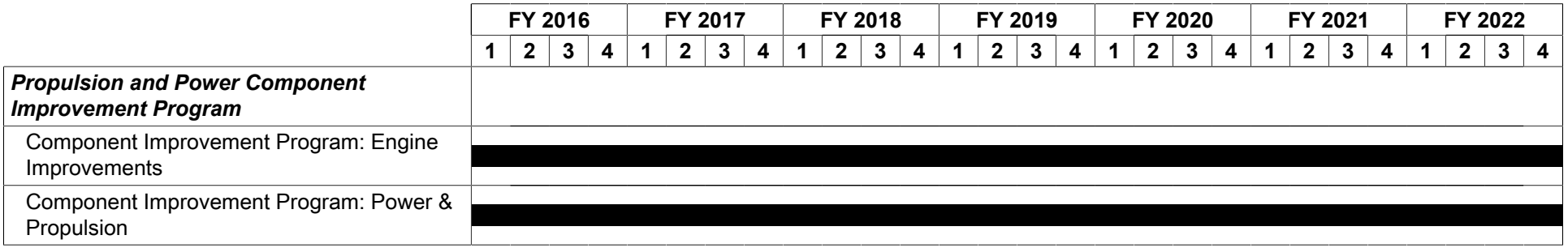


Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Propulsion and Power Component Improvement Program				
Component Improvement Program: Engine Improvements	1	2016	4	2022
Component Improvement Program: Power & Propulsion	1	2016	4	2022

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 2269 / *Expeditionary Airfield Improvements*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
2269: *Expeditionary Airfield Improvements*	24.057	17.838	14.948	12.359	-	12.359	3.774	0.804	0.000	0.000	0.000	73.780
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Expeditionary Airfields (EAF) program was a FY2012 New Start, with funding released to the project in May 2012. The EAF program designs, develops and tests a Sustainment Lighting System (SLS) to replace the obsolete legacy EAF lighting system. This system will provide EAF Marine Aircraft Wing Support Squadrons with the required EAF equipment to install Forward Operating Bases and Forward Arming and Refueling Points. With the deployment of this equipment, the Marine Aircraft Wing Support Squadrons can support all United States Marine Corps (USMC) aircraft allowing the Combatant Commanders the flexibility to deploy Aircraft Combat Elements to meet anticipated threats. Milestone B moved from third quarter of fiscal year 2014 to first quarter of 2015 due to contract negotiation delays.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Expeditionary Airfields Improvements	17.838	14.948	12.359	0.000	12.359
Articles:	-	-	-	-	-
Description: The EAF program designs, develops, tests and fields a Sustainment Lighting System (SLS) to replace the obsolete legacy EAF lighting system. This system will provide EAF Marine Aircraft Wing Support Squadrons with the required EAF equipment to install Forward Operating Bases and Forward Arming and Refueling Points. With the deployment of this equipment the Marine Aircraft Wing Support Squadron can support all USMC aircraft allowing the Combatant Commanders the flexibility to deploy Aircraft Combat Elements to meet anticipated threats.					
FY 2016 Accomplishments: Completion of the Preliminary Design Review (PDR) for hardware and software leading up to the completion of the critical design. Continue the design, development, and integration of the SLS program.					
FY 2017 Plans: Conduct Critical Design Review (CDR), Test Readiness Review (TRR), and begin Developmental testing(DT).					
FY 2018 Base Plans: Continue Developmental (DT) testing, conduct the Operational Test Readiness Review (OTRR) and Operational Testing (OT).					
FY 2018 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 2269 / *Expeditionary Airfield Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
N/A					
Accomplishments/Planned Programs Subtotals	17.838	14.948	12.359	0.000	12.359

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• OPN/4213: *ASE-Expeditionary Airfields*	8.425	7.984	8.230	-	8.230	8.438	8.603	8.830	9.006	Continuing	Continuing

Remarks

OPN 4213 includes a portion of line item funding for Expeditionary Airfields.

D. Acquisition Strategy

Expeditionary Airfields (EAF): Cost Plus Incentive Fee contract for the system design, development, integration and testing of the Sustainment Lighting System awarded in December 2014.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 2269 / *Expeditionary Airfield Improvements*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Lakehurst, NJ	11.089	6.740	Nov 2015	6.151	Nov 2016	4.021	Nov 2017	-		4.021	1.189	29.190	-
Primary Hardware/ Software Development	C/CPIF	Tactical Lighting Systems, Inc : Addison, Illinois	4.993	8.723	Jan 2016	6.600	Feb 2017	5.411	Jan 2018	-		5.411	2.165	27.892	27.892
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	1.700	0.000		0.000		0.000		-		0.000	0.000	1.700	-
		Subtotal	17.782	15.463		12.751		9.432		-		9.432	3.354	58.782	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics	WR	NAWCAD : Lakehurst, NJ	0.875	1.083	Nov 2015	0.657	Nov 2016	0.545	Nov 2017	-		0.545	0.429	3.589	-
Prior Year Support no longer funded in the FYDP	Various	Various : Various	3.637	0.000		0.000		0.000		-		0.000	0.000	3.637	-
		Subtotal	4.512	1.083		0.657		0.545		-		0.545	0.429	7.226	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NAWCAD : Lakehurst, NJ	0.942	0.925	Nov 2015	1.122	Nov 2016	1.988	Nov 2017	-		1.988	0.380	5.357	-
Opeval Test Support	WR	COMOPTEVFOR : Norfolk, VA	0.069	0.057	Nov 2015	0.113	Nov 2016	0.166	Nov 2017	-		0.166	0.125	0.530	-
		Subtotal	1.011	0.982		1.235		2.154		-		2.154	0.505	5.887	-

Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Navy			Date: May 2017
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 2269 / *Expeditionary Airfield Improvements*	

Management Services ($ in Millions)

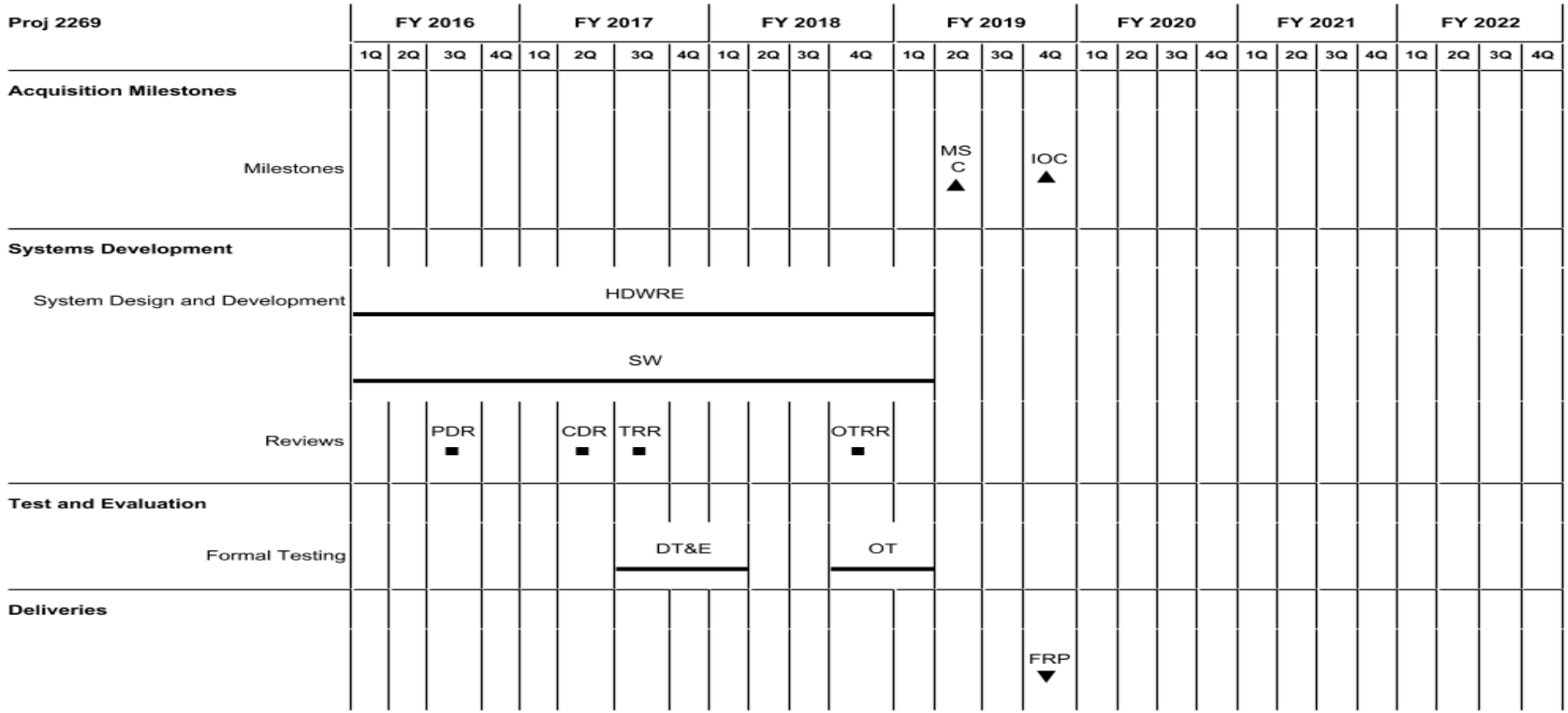
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2016 Cost	FY 2016 Award Date	FY 2017 Cost	FY 2017 Award Date	FY 2018 Base Cost	FY 2018 Base Award Date	FY 2018 OCO Cost	FY 2018 OCO Award Date	FY 2018 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support Services	C/CPFF	Various : Various	0.752	0.310	Dec 2015	0.305	Dec 2016	0.228	Dec 2017	-		0.228	0.290	1.885	1.885
		Subtotal	0.752	0.310		0.305		0.228		-		0.228	0.290	1.885	1.885

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	24.057	17.838		14.948		12.359		-		12.359	4.578	73.780	-

Remarks

Prior Year includes $4.9 million of Congressional Add funding.

Exhibit R-4, **RDT&E Schedule Profile:** FY 2018 Navy		**Date:** May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 2269 / *Expeditionary Airfield Improvements*



2018OSD - 0205633N - 2269

Exhibit R-4A, RDT&E Schedule Details: FY 2018 Navy		Date: May 2017
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 2269 / *Expeditionary Airfield Improvements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2269				
Acquisition Milestones: Milestones: Milestone C	2	2019	2	2019
Acquisition Milestones: Milestones: IOC	4	2019	4	2019
Systems Development: System Design and Development: Hardware Development	1	2016	1	2019
Systems Development: System Design and Development: Software Development	1	2016	1	2019
Systems Development: Reviews: Preliminary Design Review	3	2016	3	2016
Systems Development: Reviews: Critical Design Review	2	2017	2	2017
Systems Development: Reviews: Test Readiness Review	3	2017	3	2017
Systems Development: Reviews: Operational Test Readiness Review	4	2018	4	2018
Test and Evaluation: Formal Testing: Tech Eval/Dev T&E	3	2017	1	2018
Test and Evaluation: Formal Testing: Operational Testing	4	2018	1	2019
Deliveries: Delivery: Lot 1	4	2019	4	2019